

SCIENTIFIC EXPLORATION IN CENTRAL ASIA.¹

IT is with a lingering feeling of regret that we recognise how different, of necessity, are the explorations of the present day from those of fifty years ago. No longer is it possible, except in rare instances, for a traveller to return with tales of new discoveries of lakes, sources of rivers, mighty peaks, and of the strange peoples that dwell there. Much work still remains, but it is of a more scientific nature, and therefore will probably provide matter which when published may be less entertaining and less widely read. When a traveller makes a speciality of one particular branch of science, as Dr. Gottfried Merzbacher does in his volume on "The Central Tian-Shan Mountains," to the almost entire exclusion of all others, it follows that he can only appeal to a limited number of readers; to those, in fact, who are interested in the study of geology and glaciers. We would, however, make this reservation, that the photographs which adorn this book are exceptionally beautiful representations of snow scenery, and will more than satisfy the ordinary reader as well as the man of science, and that the map is of great general value.

For two seasons, 1902-3, did Dr. Merzbacher and his companions labour in the central Tian-Shan Mountains which lie north-east of Kashgar. Russian explorers have visited this district many times, but the main backbone of the range has never been closely explored, and Dr. Merzbacher was able to discover and correct many errors in existing maps. We would here point out the growing necessity for the closer interchange of information between the various scientific societies of different countries. Dr. Merzbacher met a Russian expedition which to his delight was not intending to work over quite the same tract of country, while Dr. Friedrichsen and Signor Giulio Brocherel have already published the results of their explorations of the same range, which were being undertaken almost simultaneously with those of Dr. Merzbacher and his companions. Healthy rivalry is to be encouraged, but such overlapping of work as this is regrettable.

In this volume, which is of the nature of a preliminary report, Dr. Merzbacher has embodied observations on the present and past glacier conditions of the Tian-Shan Mountains, and on peculiarities in the physical features of its valley formations, subjects to which, throughout the expedition, his attention was specially directed. A more detailed report, however, is to follow when his rich collections have been scientifically examined and arranged.

¹ "The Central Tian-Shan Mountains, 1902-1903." By Dr. Gottfried Merzbacher. Pp. ix+285. (London: John Murray.) Price 12s. net.

We trust that the botanical, zoological, and climatological observations, which have been almost entirely omitted from this volume, will be included in the more detailed report. We cannot help feeling that a preliminary volume, such as this is intended to be, should have included some reference to these other subjects, while some of the geological and glacial notes might have been left to the more detailed report.

The care with which Dr. Merzbacher explored is worthy of the highest praise, leaving little or nothing

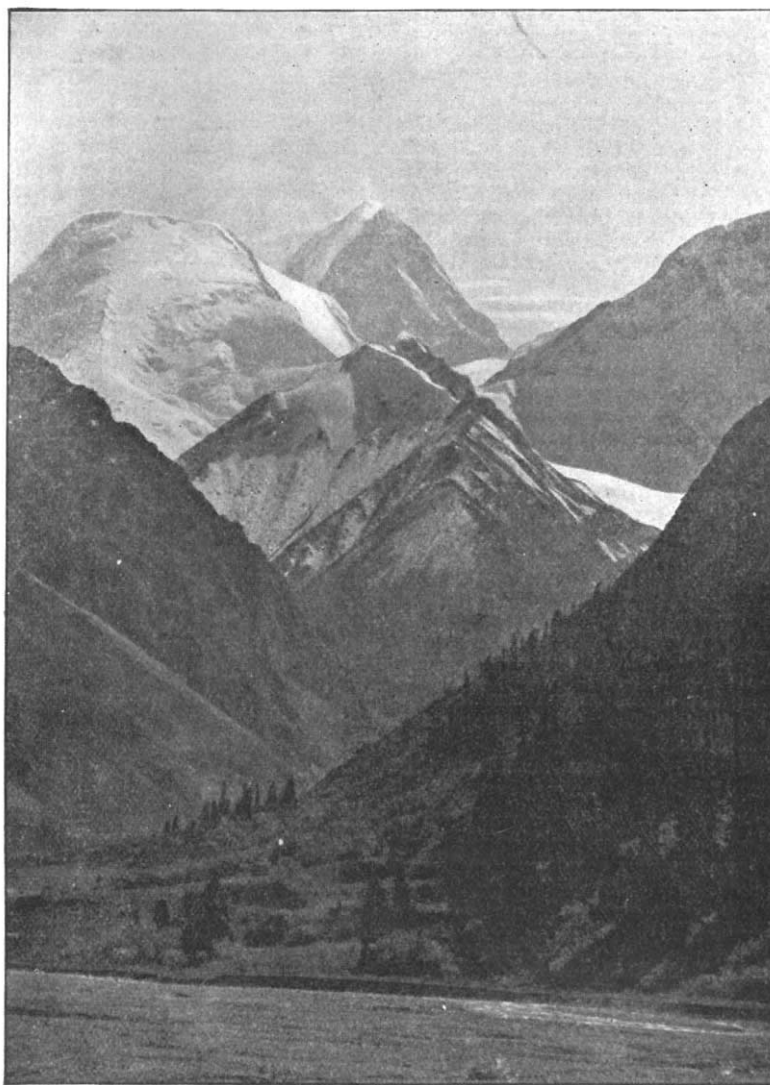


FIG. 1.—Telephotographic View of Khan-Tengri (about 23,600 feet), taken from North, from the Middle Course of the Bayunkol Valley. Distance about 24 miles. From "The Central Tian-Shan Mountains, 1902-1903."

for any future travellers in this region to accomplish. He made his winter quarters at Kashgar, but was not content to wait for more clement weather, and made many useful excursions during the winter months, which happened to be unusually mild. It would be out of place to attempt here a description, however short, of his journeyings, and indeed, without a map, it would be nigh impossible to follow any such description. Each glacier, each valley, each ridge is in turn visited, surveyed, and described. The position of the great peak of Khan-Tengri

(23,622 feet) was correctly fixed, and the discovery was made that this, the culminating eminence of the whole Tian-Shan, does not stand in the main watershed, and is not a nucleus of converging ranges, but is situated on a secondary spur which projects from the main range far to the south-west. The true "nucleus" is the so-called "Marble Wall," which in lieu of a better name Dr. Merzbacher has christened after the president of the Imperial Russian Geographical Society Mount Nicholas Mikhailovich! The Inylchek glacier was found to have a total length of from forty-three to forty-six miles, in place of six to eight miles as previously supposed, and another equally large glacier was discovered but not visited. In the matter of climbing Khan-Tengri, which has been sometimes wrongly assumed to have been the main object of this expedition, Dr. Merzbacher points out the difficulties, which will probably have the result of exciting someone to make the attempt.

An accident which resulted in the unfortunate destruction of many photographic plates gave the energetic traveller an excuse for revisiting some of the ground already traversed, and enabling him, owing to the finer weather, to take still better photographs. Dr. Merzbacher's visit to the alpine lakes, such a rare phenomenon in the central Tian-Shan, and his notes thereon are of great interest, but as winter was closing in work became more difficult, and the expedition finally reached Tashkent *via* Kulja.

Regarding this volume as a preliminary report Dr. Merzbacher deprecates drawing conclusions from the facts noted until his rich materials have been examined by competent experts. He however mentions one point on which his scientific conviction is settled once and for all, namely, that for the Tian-Shan also an Ice age has to be accepted.

Photography was used on this expedition to an unprecedented extent, many beautiful views being due to the telephotographic process, which was used with excellent results. In addition to botanical and zoological collections climatic observations were taken twice daily, while the map was compiled with great care, and is also well drawn and beautifully reproduced. It is a pity that the same symbol should have been used to denote permanent villages and the pasturages, which are only visited at certain seasons by the Kirghiz herdsmen.

This volume, which is published under the authority of the Royal Geographical Society, is a worthy record of scientific work carried out under great difficulties. The author is to be warmly congratulated.

A LARGE-HEADED DINOSAUR.

THE mounted skeleton of *Triceratops prorsus*, of which a note by Mr. Charles W. Gilmore, preparator to the department of geology in the United States National Museum, Washington, has recently been published¹ with two plates, is interesting as displaying another Dinosaur of a distinct and very remarkable type, differing entirely from the numerous series

of bipedal forms with which we are now familiar from the reconstructed skeleton of the iguanodon and its allies, and also from the ponderous quadrupedal, long-necked, small-headed *Diplodocus*, *Brontosaurus*, and *Cetiosaurus* types of gigantic herbivorous reptiles. Compared with these latter, *Triceratops* was a quadrupedal reptile of quite moderate size, the skeleton, according to the late Prof. Marsh, being not more than 25 feet in length and 10 feet in height. The present reconstruction by Mr. Gilmore still further reduces its length by the omission of six of the presacral vertebrae (introduced by Prof. Marsh), so that, as now restored, its total length is only 19 feet 8 inches.

The striking feature, which remains unchanged, is the skull, which is fully 6 feet long, and is consequently just one-third of the entire length of the skeleton as now set up.

Two powerful horn-cores of the bovine type, $2\frac{1}{2}$ feet in length, rise from the frontal bones of the skull, at the base of which are the round bony orbits. The snout is narrow and pointed, and carries a third

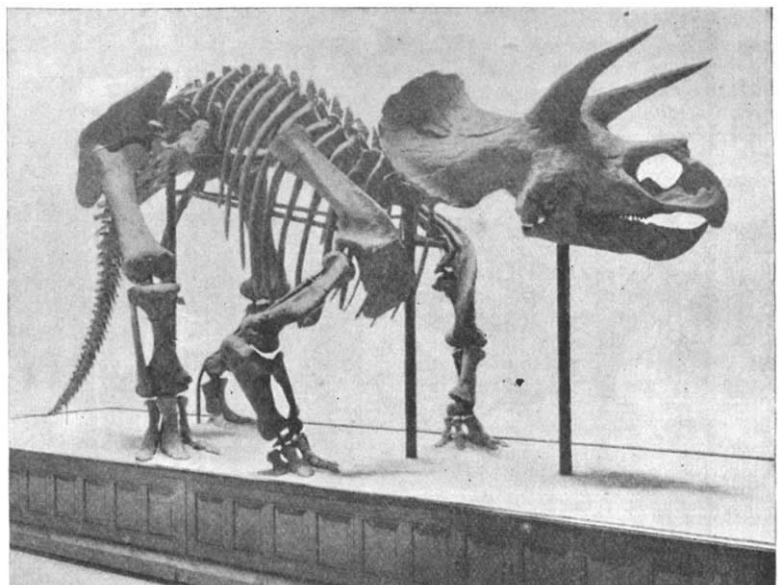


FIG. 1.—Skeleton of *Triceratops prorsus* in the U.S. National Museum. Three-quarters front view.

smaller horn upon the nasal bone. Behind the pair of frontal horns is an immense frill of bone spreading back over the occipital region and covering the first six cervical vertebrae; it was 2 feet 6 inches long and 3 feet broad, resembling an immense Elizabethan ruff, ornamented with about twenty-four pointed bosses of bone along its border. The rostrum and prementary bones were armed with pointed horny beaks, the teeth being confined to the maxillary and dentary bones, forming a single series in each jaw. They are remarkable as having two distinct fangs, placed transversely in the jaw, with distinct sockets, and are displaced vertically; the successional teeth cut their way between the alveolar margin and the adjacent root of the old tooth, or between the two roots. Prof. Marsh had published a restoration of this dinosaur in 1891 (see *Geol. Mag.*, plate vii.), the chief difference between which and the present skeleton set up by Mr. Gilmore being the reduction in the number of the presacral vertebrae, already referred to, and the placing of the limbs, especially the forelimbs (the humerus and the radius and ulna), in a

¹ *Proc. United States National Museum*, Washington, vol. xxix., pp. 433-435, with plates i. and ii., 1905.